but with the aid of a more powerful microscope very fine and numerous wavy striæ are visible on the second volution only.

The most nearly allied species appears to be *V. Strangei*, Pfr., from which the present form is at once distinguished by the different proportion of the last whorl to the others. In *Strangei* the whorls increase more rapidly, and towards the aperture the last one dilates very considerably; this is not the case in *kermadeensis*, which is more transparent, more glossy, and of a greener tint than the former.

V. dimidiata, Pfr., from New Zealand, the most nearly related species in a geographical point of view, is a very distinct form.

XXXIII.—*Observations on Chelonians, with Descriptions of new Genera and Species.* By Dr. J. E. Gray, F.R.S. &c.

The shells of adult Land-Tortoises (*Testudo*) have the sternum more or less deeply concave and the hinder marginal plate over the tail (hence often called the caudal plate) very broad, thick, and convex externally, and with the lower edge more or less inflected. These I believe to be the shells of males; and the few specimens of the animals that I have been able to examine confirm this idea. The other specimens have the sternum flat and the caudal plate narrower, thinner, and flat, with the lower edge more or less expanded. These have been concluded to be the females. The shells of both the adult and younger specimens have this form; and as there must be young males as well as females, I conclude that some of the young shells are those of males, and that the concavity of the sternum and the width and convexity of the caudal plate are not attained until the animal has arrived at the adult age. The concavity of the sternum differs in the various species; but in some species, as *Testudo tabulata*, it becomes very deep in the older specimens, and accompanied by a contraction of the sides of the shell. Specimens in this state were regarded by Spix as a distinct species, under the name of *Testudo Hercules*.

The sternum of some of the more terrestrial Terrapins, as *Geoemyda*, have the sternum of the adult very deeply and broadly concave; and some of the large specimens of American Box Tortoises (*Cistudo carolina*) have the sternum concave in the centre and convex behind. The rest of the specimens, and the three of *C. mexicana*, in the British Museum, which are all full-grown, have the sternum flat. It may be that we have no adult males of the latter. There is in the Museum a specimen of *Swanka* which has the sternum very flat in

front and concave over the hinder cross suture; some specimens of *Sternothœrus* have a rather concave sternum; and some *Hydromedusæ* have a deep narrow concavity in the middle of the hinder part of the sternum; but we have no proof of these being characters of the males.

Testudo tabulata.

There is a considerable difference in the shields of the head. Some have a pair of large plates before the large frontal; this pair varies in size. It is divided by a straight linear suture and is sometimes large; but in one specimen (*e*) it is moderate and hexagonal, with a plate in the middle before it; in another (*a*) there is a single central plate over the nostrils, and a large suborbital plate on each side of it; and in a third (*f*) there are two central nasal hexagonal plates, one behind the other, and a large plate on each side of the suture between them. In general the frontal plate is large and entire, but in some specimens it is divided in half.

Peltastes geometricus.

Four of the larger specimens in the British Museum have a large, very convex, and much inflexed caudal plate, and are perhaps males, as the three larger ones have the centre of the sternum more or less concave: the smaller one has this part flat; and the caudal plate is convex, but not to the extent of the larger ones. Three of the small specimens indicate a more or less inclination to become convex; while five, of about the same size, have this plate quite flat, with a more or less reflexed lower edge.

Peltastes tentorius.

One specimen, received from Mr. R. Brown, has the caudal plate very convex and inflexed—most probably a male. In all the other seven specimens in the Museum the caudal plate is flatter and spread out.

Peltastes stellatus.

The anal notch angular, broad apparently in both sexes. Hinder part of thighs with a large group of conical acute scales.

The males have a sternum slightly concave the whole length of the central line. Caudal plate very broad, convex, with a strongly inflexed lower edge.

The females have a flat sternum and only slightly convex caudal plates, the lower edge of which is not inflexed.

Peltastes platynotus.

The two specimens in the Museum have quite flat sternums,

a broad angular anal notch, and a broad, not inflexed, caudal plate. Perhaps both were females.

Peltastes elongatus.

The males (?) have the sternum rather concave for the whole of their length, and the anal notch deep, angular, with rather long plates at the side. Tail conical, elongate, with a large horny conical spur at the end.

The females (?) have the sternum quite flat; the anal notch broad, semicircular, with short, broad, slightly produced anal shields. Tail short, thick, unarmed.

A half-grown specimen, with a flat sternum, has the anal notch more angular, but broad, and the anal plates rather longer and more acute. Perhaps the notch becomes wider and rounded as the animal approaches the breeding-age.

All the specimens in the Museum of a broad variety of this species, which came from Burmah, have a quite flat sternum and a broad angular anal notch, with moderately long angular lateral plates.

Peltastes Leithii.

The hinder lobe of the sternum mobile; caudal plate spread out; sternum flat.

Peltastes græcus.

In the British Museum there are two very distinct varieties, which were regarded as two distinct species (*Testudo græca* and *T. mauritanica*) by MM. Duméril and Bibron; and there is a very considerable difference in colour, probably arising from their more southern habitat. One has the caudal plate smooth; and the shell is generally of a dull green colour mottled with black: these are said to live on the north shores of the Mediterranean. The males and females of the others (or at least those that have a rounded, convex, or a flat caudal) are always marked with a distinct deep longitudinal groove in the centre of the caudal plate. There are some shells in the Museum reddish white, with defined regularly disposed black marks: these are said to be confined to the south shores of the Mediterranean; but I have no means of verifying this fact. The same difference of colour is observed between the *T. marginata* of Greece and the variety which has been called *T. Leithii* of Scinde.

The British Museum has a specimen brought by Mr. M'Andrew from Asia Minor, and two others obtained at Xanthus. They are all young; but they agree in being of a pale brownish-white colour, with an elongated spot on the centre of the areola of each dorsal plate. We have the upper

shell of a rather larger specimen without any habitat, but most likely from Xanthus. These four have the caudal plate without any central groove. There is another specimen very like the others, but rather older, with the caudal plate divided by a deep longitudinal central groove.

Chersina angulata.

A specimen in the Museum, of a large size (nearly 7 inches long), has the gular plate very much produced. The hinder half of the sternum is rather concave, the anal notch broad; and the caudal plate is very convex, broad, and with the lower margin inflexed. Male?

We have a specimen, about the same size, with a perfectly flat sternum rather more raised on the side, and a narrower, scarcely convex dorsal. It was probably a female.

Kinixys Belliana.

There are four specimens of the animal and shell of this tortoise.

One (*a*) has five well-developed front claws; and two others (*b* & *e*) have only four front claws, and no appearance of the fifth. In other respects the animals and shells are similar.

The sternum of most of the specimens is quite flat the whole length, and the caudal plates similar and not inflexed; so that perhaps the sexes do not differ in this species. In the smaller specimen (*f*), called *K. Spekei*, the sternum is slightly concave between the abdominal plates. In the 'Suppl. Cat. Shield Rept.,' p. 14, this specimen is compared, by slip of the pen, to *K. Homeana* instead of *K. Belliana*. Sternum in two specimens received from Abyssinia concave, one very much and deeply so.

A young specimen in the British Museum (from Mr. Bartlett's collection), about 2 inches long, has the first vertebral plate broader than long—the second about the same length and much broader, being the broadest of the series—the third shorter and narrower, especially the hinder part—the fifth narrower and shorter still. The third costal plate on each side shows a distinct suture obliquely across it, being nearer the front margin of the outer than the inner side.

Fifth lateral marginal plate sometimes produced more or less between the suture of the first and second costal ones; it is most produced in the young specimen which has been called *K. Spekei*, and which is peculiar for being pale with a square black areola.

Kinixys erosa.

All the specimens are slightly concave in the front of the sternum. Some large specimens have the concavity extending back in the middle line of the sternum to the anal plates; and the caudal marginal plates are generally thickened, but not inflexed. In the smaller specimens, which are generally more depressed and much more ventricose, the sternum is flat, except just at the back of the gular plates.

In one specimen (15 *h*), which is much darker and more beautifully coloured, the centre of the fifth vertebral plate is much more convex than usual; yet it is quite distinct from *K. Homeana*. The finger-bones are twice as broad as long; the feet-bones are rather longer than broad.

Kinixys Homeana.

This species is known by the fifth vertebral plate being large, erect, and produced near the upper margin. The upper edge of the fifth marginal plate slightly produced.

The nuchal shield in our two specimens is variable, but is distinct in both. In *b* it is regular, very narrow, and very long; in *a* it is broad, elongate, irregular, as if forming part of the left first marginal plate.

Manouria fusca.

I formerly considered that the sternum in all the museum specimens was flat; but the specimen originally figured in the 'Cat. Shield Rept.' (t. 3) has the hinder lateral margin moderately expanded, and the caudal plates convex externally and with the lower edge slightly inflexed. The sternum is rather convex on the sides, and slightly concave in the centre of the hinder part of the abdominal and preanal plates, truncated and slightly notched in front; the hinder part rather narrow, with a deep notch, the end being about half the width of the base of the preanal plates.

The other specimen is larger, with the lateral margins, both before and behind, much more expanded and bent up. The caudal plates are flat and expanded. The sternum is considerably concave for two thirds of its length; the front end is short and rounded, quite different from the elongate truncated plates in the first specimen; and the hinder lobe is broad, with a wide anal notch at the end. The hinder end is about two thirds the width of the hinder margin of the preanal plates.

Perhaps these are species, as the one which has the flat spread-out caudal plates has the most concave sternum and short rounded postgular plates, and that with a convex in-

flexed caudal has a flatter sternum and narrower postgular and anal plates.

The very fine specimen with the animal, said to have come from the river Murray, Australia, seems to be intermediate between them. The sternum is quite flat, truncated before and behind; the hinder lobe is rather broad, being, as in the smaller specimen, half as broad at the end as the hinder edge of the preanal plates with the convex inflexed caudal shields.

Cistudo carolina.

Nuchal plate generally well developed. In one specimen (*f*) in the British Museum it is longitudinally divided into two plates and very short, as is also the margin of the marginal plate next to it; in another (*k*) the nuchal plate is entirely wanting.

In most the sternum is more or less black or brown; in *f* it is very irregularly spotted and striped with yellow. In many shells the keel of the vertebral plates is yellow.

A specimen (*l*) from Louisiana is much paler, with the margin more reflexed and produced. The animal has a pale streak from the hinder edge of the beak, over the ear, along the side of the neck. It is called the "Woodland or Canebrake Tortoise."

Cistoclemmys flavomarginata.

The shell black, with a red vertebral streak, the discal and upperside of marginal plates with a red spot; underside of marginal plates yellow. Head with a narrow streak on the side, from the back edge of the orbit, which is dilated into a blotch behind.

This species is most distinct from *Cuora trifasciata*, with which it has been proposed to be united when only examined in spirits. It is one of the most beautiful Box Tortoises.

This animal is most distinct from all the varieties of *C. amboinensis* by the streak on the back of the head commencing at the back angle of the eye, narrowed in front and gradually widening behind; whereas the streak of *Cuora amboinensis* begins at the nostrils and is continued over the eye, along the sides of the neck, and is nearly of the same width throughout, or only a little wider behind.

Dr. Günther has arranged this species with *Cuora*; but the toes are shorter and much less webbed than in that genus, which has a very distinct web fringed on the margin.

Cuora amboinensis.

The alveolar processes of the upper jaw narrow, with a sharp

raised margin on the outer side, and a slightly raised margin on the inner side. Lower jaw produced and incurved in the middle, with a sharp raised margin on the outer side, and a slight raised line on the middle of the inner margin. The sternum flat, slightly concave in the middle.

Two specimens (one from Gilolo) have the hinder half of the sternum decidedly concave in the middle, but not much so. All the others in the Museum have this part flat. The Gilolo specimen is marked as a male.

This species varies much in the convexity of the shell, and presents two very distinct varieties :—

I. The sternum brown-varied, sometimes entirely brown. The youngest specimens I have seen are of that colour beneath. The dorsal plates pale, with dark brown areolæ. Philippines.

II. Sternum pale whitish, with a black spot on each areola. The younger specimens are white on the sides and more or less black on the central longitudinal line of the sternum; and the spots remain in the older specimens.

Specimens of this variety come from the Philippines, Celebes, and Borneo.

Cuora trifasciata.

One of the specimens in the British Museum wants the nuchal shield, which is present in all the four others.

CYCLEMYS.

The ribs of the very young specimens are lanceolate, united to the vertebra as by a footstalk, then suddenly dilated, and almost immediately gradually attenuated like a lanceolate leaf. The sternum bony only on the margin, the four pairs of bones forming a ring, leaving a very large hollow place in the centre. The odd bone triangular, longer than broad; the lateral pair of bones on each side entirely separate from one another, and only meeting by an attenuated process. The front lateral bones united to the dorsal disk by a much narrower external lateral process than the hinder ones. The central space becomes gradually filled up on the inner side, leaving in the older specimens only a small membranous opening, which at length becomes quite filled up.

Cyclemys dhor.

In the younger specimens the front dorsal plate is about as long as broad, sometimes rather wider in front, but generally contracted in front and wider on the sides, so as to be broadly

lanceolate. In the older specimens the front plate becomes more elongate compared with its breadth, and narrowed in front. The second vertebral shield becomes longer compared with its length as the animal increases in age. In one specimen the vertebral plates are very irregular, with two supernumerary plates, and the front plate is broader than long; but I believe this is only a deformity.

Dr. C. Giebel, in the 'Zeitsch. gesammt. Naturwissensch.' 1866, p. 15, describes a *Clemmys dentata*, which he says is the same as *Emys dentata* of my 'Illust. Ind. Zool.' ii. t. viii., from the Isle of Banka. He figures three specimens (t. iii.), exhibiting supernumerary dorsal, or posterior marginal, or both posterior dorsal and posterior marginal plates (t. iii. f. 1–4). See 'Append. Cat. Shield Rept.' p. 22.

The figures of Dr. Giebel are very like the young specimen of *Geoemyda grandis* in the British Museum, from Camboja, which has the vertebral plates very irregularly divided.

In the British Museum there is a specimen of *Elseya latisternum* with additional caudal marginal plates.

Nicoria Spengleri.

The adult animal is pale above, with a black streak on the outside of the vertebral and costal shields; the underside of margin and sternum black, with a white streak round the circumference of the flat part of the sternum. The lateral dorsal keels appear to be wide apart in the young specimens.

Geoclemmys Mühlenbergii.

The shell is variously spotted and streaked with black, but leaving a distinct longitudinal pale vertebral streak.

Glyptemys pulchella.

The sternum of an imperfect skeleton, prepared by Dr. Günther, in the British Museum is rather concave the whole of its length. The alveolar surface of the upper jaw is wider than it is in the specimen figured, which may also be a character of sex.

Emydina.

The lower jaw of this tribe offers two modifications:—

I. The alveolar edge is simple, shelving, acute, with a sharp edge on the outer side. *Melanochelys.*

II. The alveolar edge is concave, shelving inwards, with a more or less prominent margin on the inner side and raised sharp edge on the outer side. *Emys*, *Eryma.*

Melanochelys trijuga.

The skull is at once known from *Bellia crassicollis* by the alveolar surface and the sharp simple edge of the lower jaw.

The shell of this species greatly varies in colour, for example :—

a. Shell black above, with three yellow keels, more distinct when worn.
Sternum black, with a well-marked yellow margin; lateral margin of shell yellow.
Sternum and shell like the former, but lateral margin with irregular pale blotches.
Sternum and lateral margin of shell blackish brown.

b. Back brown, keels not paler.
Sternum blackish, with a narrow yellow edge.
Sternum brown, slightly paler on the edge.
Sternum pale brown, with a broad yellowish border and under margin to the shell.

In the older specimens the plates become very rugose, of a blackish-brown colour, and often covered with a brown-reddish earth.

In the younger specimens the first vertebral plate is quadrangular, about as long as broad, and rather narrower behind than before; but as the animal enlarges the anterior vertebral plate becomes much longer than broad, and is marked with a line extending up each side of the plate, forming a narrow area behind; and the upper front margin of the first costal plate overlaps the hinder part of the side of the first vertebral so as to make the plate appear very narrow behind. In a very old solid specimen in the British Museum it has entirely lost the broad square form of its youth, or the elongate urceolate form, partly covered by the overlapping front edge of the first costal, of its more adult age, and become a narrow elongate plate, which is much narrower behind.

The half-grown have a rhombic space covered with membrane in the middle of the sternum, the centre of it placed rather behind the suture between the pectoral and abdominal plates.

The dorsal plates of the younger specimens often have tubercular radiating lines from the angles of the areola to the margin.

The young specimens from Ceylon have the edge of the keels and the margin of the shell yellow, like the large specimen from India (*f*) which I have called *Melanochelys Sebæ*; but they appear to pass into the other specimens with the yellow on the margin more diffuse. In these young specimens

the middle of the sternum is black the whole of its length, and the sides are white or yellow; but the black seems to extend as the animal grows. The size and number of the spots on the head of the young specimens seem to vary in the different specimens from Ceylon, which makes me think that *M. Sebæ* is only a variety.

Emys.

I. Sides of head and neck with regular lines. *Emys caspica*; *E. pannonica*, Asia Minor; *E. Tristrami*, Holy Land; *E. arabica*, Arabia Petræa; *E. Fraseri*, Algiers.
II. Head with a spot on temple and a ring behind it; lateral processes of sternum with two spots. *Emys flavipes.*
III. Head with a spot on the temple. *Emys laniaria.*

In the young specimens of *E. caspica* there is a black-edged red spot in the centre of each costal shield; the centre of it is often raised, forming a keel. The nuchal shield is not marked with a pale central streak.

In young *E. pannonica* there is no indication of this, but the dorsal shields are marked with black-edged, branched, diverging lines. Sternum black, with white spots on the outer side.

E. arabica is marked with dark-edged branched lines like *E. pannonica*; but the nuchal shield has a yellow streak down its centre; and the sternum is black, with red spots on the outer edge. These may very likely be varieties of *caspica*; but we want more specimens of different ages and localities to determine this question.

Emys laniaria has a spot on the temple, but no distinct ring on the tympanum, only some crescent-shaped marks. The fore legs have yellow lines. The sternum is black beneath and on the lateral processes, with a pale margin and reddish stripe on the suture between the outer end of the pectoral and abdominal plates and the inner edge of the marginal plates, very unlike the colouring of *E. flavipes*. Indeed nothing can be more unlike than the colouring of the sides of the head, neck, and feet of these two species; and they are both most distinct from *Mauremys fuliginosa*.

Emys caspica.

Upper jaw with a flat alveolar plate, rather broader behind, inner edge gradually tapering off towards the central line. Lower jaw with a rather broad slanting alveolar surface, with a sharp external margin and a very slightly raised internal edge.

ERYMA.

Upper jaw with flat alveolar plates, which are broad behind, much narrower in front, and separated from each other by an impressed space. Lower jaw with a broad, concave, alveolar surface with a raised edge on the inner side and a much more raised edge on the outer side.

Pseudemys concinna.

The colouring of the head and neck is moderately permanent; but the colouring of the back of the shell and underside of margin differs very considerably, and almost appears to be of a different type in each of the five specimens in the British Museum.

Damonia macrocephala.

Young shell with a central space, which diminishes into a small rhombic one in the half-grown animals. Sternum of young shell brown, with a whitish keel on each side. Older shells white, with a black blotch on each shield.

The specimens first described were only half-grown; and there are three very distinct keels, and the first dorsal is square.

In the skeleton of an old specimen called *Emys subtrijuga*, from the Leyden Museum, the middle of the back has a slight central keel; and the lateral keels are very blunt, nearly obliterated, only making the middle of the back lower than the rest of the shell. The nuchal plate is generally much broader behind than in front.

Damonia oblonga.

The colouring of the head and beak of the specimen from Batavia, which I have described under the name of *Damonia oblonga* (Ann. & Mag. Nat. Hist. 1871, viii. p. 367), is so exceedingly like the other specimens of *Damonia macrocephala*, that I am inclined to consider it either a local or accidental variety of that species, having a much narrower oblong body and shell.

Damonia Reevesii.

Shell of adult animal very thick, about 4 inches long, and the vertebral and costal bones under the keels much raised: indeed they produce the tubercular keels; for the plates over them are comparatively thin and only conformable to the bones beneath. The first vertebral shield nearly as broad as long, and scarcely contracted on the sides; the thin discal plates have a few obscure pale rays, most distinct near the margin.

The sternum is quite flat. The spots on the side of the nose are very distinct and slightly convex. The margin is much contracted at the openings, especially the hinder one, as in the Bataguridæ. The vertebræ are very small and slightly raised, and easily separated from the costal plates.

Graptemys pseudogeographica.

The head with a streak between the nose and each eye, and with a curved line behind each eye; the streak varies greatly in width and distinctness, but is always present. The back of the shell varies in height; but in some the back is sloping but flat on the side, and much elevated in the middle, forming a kind of penthouse. The claws vary greatly in length: in some only the three middle front claws are lengthened; but in other specimens all the claws, before and behind, are much lengthened and slender.

Kachuga trilineata.

Nuchal shield broad. Sternum of young shell with four square unossified spaces. Dorsal plates well developed; lateral plates with nine unossified spaces on each side. Claws 5.4.

Kachuga dentata.

Nuchal plate broad.

Batagur lineata "d," Gray, Cat. 36.

Hab. South India, river Kistna (*Elliot*).

Known from the young of *K. trilineata*, because that has the sternum much sooner ossified, and has a brown spot on each vertebral plate, and a small brown spot on the hinder edge of each costal plate.

Kachuga major, Hand-list Sh. Rept. p. 51.

Nuchal shield linear, very narrow.

Hab. India?

Only known from a very young specimen of a large species. The specimen, $4\frac{1}{4}$ inches long, has the ribs linear, very thin, only very slightly ossified near the vertebræ. The sternum has three square spaces unossified. In a much larger specimen this part is more ossified than in smaller specimens in the Museum.

Ocadia sinensis.

An adult specimen, $8\frac{3}{4}$ inches long, from Formosa is black and bluntly three-keeled, which is scarcely apparent in the two adult specimens that lived for a long time in the Zoolo-

gical Society's Gardens, and were described as *Emys Bennettii*. The underside is white, with large solid black spots.

Kinosternon.

The pelvis very large, the hinder rami long, cylindrical. The anterior part broad and concave in front, as in *Swanka*.

The skeleton of *Staurotypus* is very like that of *Kinosternon* and *Swanka*.

Swanka.

The sternum of almost all the specimens is flat or slightly convex; but in one specimen (*g*) in the British Museum, which has rather a large head, the sternum is very flat in front and concave, especially over the hinder cross suture.

Swanka scorpioides.

The specimens appear to differ in the development and length of the tail, and in the strength of the spine at the end of it, which is strongest in the longest-tailed. These are said to be sexual differences; but there is no difference in the form of the sternum, or of the caudal marginal plates, between the long- and short-tailed specimens.

The three-keeled *Swanka scorpioides* generally has the caudal end of the sternum entire and rounded; the single-keeled *S. maculata* has this part truncated or notched, as is also the case in *S. fasciata*, of which only a single specimen has been observed.

The anterior lobes of the sternum covered by the postgular and pectoral plates united into one bone, with a straight suture. The abdominal plates cover four four-sided bones. The preanal and anal plates cover the hinder mobile flap, which consists of a pair of bones separated by a central suture.

The pelvis has very long, slender lateral bones to the vertebræ; the front of the pelvis is very peculiar, having a large concavity occupying nearly the whole of its surface in front.

The hinder toes are scarcely longer than the front ones.

Hydromedusa.

This genus may be divided into two subgenera.

I. *Hydromedusa.*

The head rather large, back of neck smooth. Front pair of marginal plates four-sided, broader than long; the front vertebral plate oblong, transverse, as broad as the front marginal plates, with truncated sides; the two hinder vertebral and

costal plates tubercular. Head and back of neck brown; lower side of throat pale.

* *The second vertebral plate simple, and narrower than the first vertebral plate.*

1. *Hydromedusa Maximiliana.* B.M.

The front vertebral plate oblong, transverse, broad, and angularly bent at the sides; the second vertebral plate four-sided, longer than broad, simple at the front lateral angles, and scarcely broader than the hinder end; the hinder vertebral and costal plates with a prominent tubercle on the hinder edge. Front pair of marginal plates very large, four-sided, twice as broad as long. Sternum deeply concave behind. The intergular plate large and broad; the angular part behind not so long as the front square part.

Hab. Brazil.

The second marginal plate on each side large, broad, pentagonal, the inner side being, like the ninth marginal plate, biangular on the inner side. The two last vertebral and costal plates tubercular. The sternum, on the suture between the two hinder pairs of plates, very deeply concave.

** *Second vertebral plate with a narrow projecting lobe at the front lateral angles, rather wider than the first vertebral plate.*

2. *Hydromedusa platanensis*, Hand-list Sh. Rept. p. 64. B.M.

Front vertebral plate very short, more than three times as broad as long, transverse, truncated at the ends; second vertebral plate four-sided, longer than broad, with a small projecting lobe at the front lateral angles, which project beyond the edge of the front vertebral plate. Front pair of marginal plates very large, broader than long. The two hinder vertebral plates with a prominent tubercle on the hinder edge. Sternum flat both before and behind. Intergular plate large and broad, the angular part behind longer than the front square part.

Hab. Rio de la Plata (*Bravard*).

The tubercles on the vertebral and hinder costal plates are not nearly so large as those of *H. Maximiliana*; and the last but one of the lateral plates is very broad, the angle in the middle of its inner side very acute, and extending far up along the hinder edge of the last costal.

The front central bone behind the pelvis square, divided by a suture down the centre; and the hinder bone between it and

the caudal marginal bones large, oblong, transverse, the hinder side being separated by an arched suture from the upper hinder margin of the penultimate marginal bone.

**** The second vertebral plate with broad projecting front lateral angles, which are much wider than the first vertebral plate.*

3. *Hydromedusa Bankæ*, Giebel, Zeitschr. f. ges. Naturw. 1866, t. iv.

The front marginal plates square, four-sided, rather broader than long. First vertebral plate oblong, more than twice as wide as long, truncated at the sides, rather widening behind, as broad in front as the two front marginal plates, the hinder edge arched; the second vertebral plate as long as broad behind, much wider in front, with the front lateral angles produced beyond the sides of the front vertebral plate, and angular, with two short sides, the sides straight and gradually contracting to the width of the next plate; the other vertebral plates six-sided, not quite so long as broad. The hinder vertebral and costal plates do not appear to be tubercular.

Hab. "Island of Banka" (*Giebel*).

II. *Chelomedusa.*

Head moderate, back of neck tubercular. Front pair of marginal plates subtriangular, broad on the inner side, narrow on the outer side; the first vertebral plate narrow in front, and as wide as the four marginal plates, wide behind, with shelving sides.

The hinder vertebral and costal shields not tubercular. Sternum flat. The head and upper part of neck dark brown, the upper lip and undersides of head and neck white.

** The second vertebral plate moderate, with a narrow projecting lobe on the front lateral angle, as wide as the first vertebral plate.*

4. *Hydromedusa depressa*, Hand-list Sh. Rept. p. 64. B.M.

Front vertebral plate very short, transverse, narrow in front, twice as broad behind, and angular at the ends; the second vertebral plate four-sided, longer than broad, with a small projecting lobe at the front lateral angle, projecting as far as the hinder edge of the front vertebral plate. The front pair of marginal plates moderate, longer than broad. The costal and dorsal plates with a brown spot on the hinder part, without any tubercle.

Sternum flat; the front plates irregular in this specimen. Gray, Cat. Shield Rept. p. 60, t. xxvi.

Hab. Brazil (*Brandt*).

** *The second vertebral plate broader than the first vertebral plate in front, truncated at the front lateral angle, contracted behind to the width of the front end of the third vertebral, with straight sides.*

5. *Hydromedusa flavilabris.* B.M.

The front pair of marginal plates subtriangular; the front vertebral plate twice as broad behind as long.

Hab. Brazil.

This species is known from *H. depressa* by the smaller size of the front vertebral plate and the larger size and broader front lateral end of the second vertebral plate.

It is unfortunate that we have only a single specimen of each of these species; and it is possible that what have been considered specific characters may be only sexual or accidental differences.

Hydraspis depressa.

Back broadly keeled. Costals with an obscure keel towards the upper edge. The vertebral shields with an oblong spot on the hinder edge of each plate; costal shields with a minute spot on the upper part of the hinder margin. The web with a white spot between each of the toes.

Hydraspis Gaudichaudii.

Young. Head large, back of neck smooth. Pale brown, minutely darker-speckled; margin pale; sternum and underside of margin with a large rhombic black spot covering most part of the centre; head brown, throat and lower part of sides of neck, including the tympanum, white, with small brown spots.

Hab. Bahia.

Hydraspis bicolor, Hand-list Sh. Rept. p. 65.

Head moderate, brown, black-varied; face with radiating short black spots and lines; a streak from the back of the eye, over the ear, along the side of the neck; tympanum white, with a black perpendicular stripe not reaching quite to the bottom; chin white, which is wider on the sides, and with a black spot in the middle. Shell oblong, depressed, black above and below; the lower side of the disk, the sterno-costal suture, and the outer edge of the sternum white; the sutures of the underside of the marginal plates blackish. The limbs and feet blackish, with the lower sides of the thighs and hind legs grey, black-dotted.

Hab. Demerara Falls.

Hydraspis maculata, Hand-list Sh. Rept. p. 65.

Head large, brown above and below, with a broad streak from nostrils, under the eye, continued along side of head, including ear and on the upper and lower lips; back of neck smooth; the hinder part of the throat white. Dorsal shield brown, with a white spot in the middle of the upper edge of the first costal. The underside of the margin, triangular marks on the upper edge of the margin, the sterno-costal sutures, the lateral sides of the front lobe, and the hinder part of the hinder lobe of the sternum pale. A rhombic spot occupying the greater part of the disk of the sternum dark brown; this spot is acutely angular in front, and rounded behind.

Hab. Tropical America.

ACANTHOCHELYS.

Head oblong; chin two-bearded; back of neck covered with conical spines. Thorax oblong, with a central longitudinal depression. Nuchal plate distinct. Anterior vertebral plate large (in the adult), about as long as broad, broad in front and narrow behind; the second and third elongate, six-sided. Intergular plate broad, longer than the gular.

Acanthochelys Spixii, Hand-list Sh. Rept. p. 66.

Hydraspis Spixii.

Hab. Brazil.

In the British Museum we have a specimen of this species which is covered with short, rigid confervoid fibres. It was for many years in spirits, but has lately been stuffed.

MESOCLEMMYS, Hand-list Sh. Rept. p. 66.

Head moderate, depressed; eyes anterior; crown broad, extending to the occiput; the sides rather concave, covered with regular-shaped shields—two pairs in front and two behind, and one elongated hexagonal central. Temples covered with polygonal shields. Tympanum large, superficial. Back of neck granular. Chin two-bearded.

Shell solid, rather depressed. Nuchal shield distinct. Anterior vertebral shield elongate, wider behind; the fourth and fifth keeled.

This genus is between *Hydraspis* and *Platemys* in the form of the skull, but is known from both by the regular shields on the head.

Mesoclemmys gibba.

Hydraspis gibba, Gray, Cat. Shield Rept.
Platemys gibba, Dum. & Bib. Erp. Gén. ii. p. 416, t. xx. fig. 2 ? (bad).

Hab. "Madagascar" (*Parzudaki*); South America (*Bibron*).

STERNOTHÆRUS.

Some specimens have a rather concave or flattened sternum, perhaps males; they appear to have the anal shields larger and more produced. Others have the sternum slightly convex, and the anal plates not so much produced as in the female and young land-tortoises.

Sternothærus sinuatus, with the broad first vertebral, has the sternum very intense uniform black. *S. Derbianus*, with the narrower first vertebral shield, has the sternum black on the margins and more or less white in the centre of the disk.

Trionyx? Dillwynii, Hand-list Sh. Rept. p. 79.

Head and body olive, uniform white beneath. Dorsal disk with close longitudinal, rather converging, rows of small granules. Head above olive, with several uniform narrow streaks becoming rather broader behind:—one from the side of the nose along the border of the upper lip, edging the white of the front of the throat; the second extending from the tip of the nose to the eye, through the eyelids, to the outer angle of the eye, and bent down behind over the tympanum. A central streak commencing before and extending between the eyes to the occiput, and with a branch on each side just behind the eyes, which is widened and extended on the upper part of the side of the neck.

Hab. Borneo (*Cutter*).

This species is very distinct in the colouring of the head; and as there is only a single specimen, I cannot have the head extracted.

We have lately received a beautiful skull of *Isola peguensis* from Borneo; but that is at once known from this species by the head being minutely and uniformly dotted with white.

EMYDA.

The synonyma of the two species are very much confused.

1. *Emyda granosa.*

The hinder callosities oblong and oblique, and diverging with regard to each other.

This genus was first figured by Lacépède in 1788, in his 'Quadr. Ovipar.' t. xi., under the name of "La Chagrinée," from a specimen sent by Sonnerat from India. He does not represent the sternum, but only says it has seven callosities—three in front, two in the middle, and two behind; so that it is impossible to determine to which it belongs. Shaw copies Lacépède's figure under the name of *Testudo granulata.*

Schœpf, in his 'History of Tortoises' (1792)*, figures *Testudo granosa*, both the back and front (t. xxx. & xxx. B), from a specimen in the collection of Dr. Bloch, who received it from Dr. Johns from the Coromandel coast. He confounds it with the *Testudo punctata* of Lacépède and the *Testudo triunguis* of Forskål. This figure represents the species with oblong, diverging, separate posterior sternal callosities; and therefore it is for this species that the name of *granosa* must be retained.

Geoffroy, in his memoir on *Trionyx* (Ann. Mus. 1809, vol. xiv.), describes a *Trionyx coromandelicus* as having seven callosities on the sternum, without saying any thing about their shape, and only figures the bones of the back; but from the habitat he quotes, Coromandel, and the observation of Cuvier quoted below, I have no doubt it was this species from continental India.

I figured the species from continental India with diverging posterior callosities, under the name of *Trionyx punctatus*, in my 'Illustrations of Indian Zoology;' and it is figured under the same name in the 'Tortoises, Terrapins, and Turtles.'

2. *Emyda ceylonensis.*

The hinder pair of callosities united by a straight central longitudinal suture the whole of their length, each of a quadrangular shape, the hinder end being much narrower than the front; the odd front callosity subcircular, being nearly as long as broad.

Cuvier, in the 'Ossemens Fossiles,' evidently believed that the form of the hinder callosities altered with age, not observing their different directions. Thus he describes and figures the hinder pair as forming a quadrilateral which is broader in front (vol. v. p. 207, t. xii. f. 47); and he observes that M. Geoffroy, in the 'Ann. Mus.,' has described those of a young individual of this species, in which the two hinder callosities have not yet united to form a quadrilateral; this is why he

* It is curious that in the copy of this work (published in 1792) in the library of Sir Joseph Banks, which has been in the museum ever since his death, I had to cut open the pages I wanted to examine, showing how little original works are consulted.

counts seven sternal callosities; but in the adult brought by M. Leschenault there are only six. It is evident that he and Geoffroy had two different species.

MM. Duméril and Bibron (Erpét. Gén. vol. ii. p. 501) adopt Cuvier's view, describing as the perfect specimen the one with the quadrilateral posterior callosities, and figuring it at t. xxii. f. 2*a*; but the synonyma include both species.

Dr. John Wagler, in his 'Nat. Syst. Amphib.' t. ii. f. 22 & 23, figures a half-grown sternum under the names of "*Trionyx coromandelicus*, Geoffroy, *Testudo granosa*, Schœpf," a nearly adult sternum of the Ceylon species with parallel posterior callosities.

There is in the British Museum a young specimen which may be different; for instead of having the back marked with various-shaped white spots or marblings, the back in spirits is pale brown, with regular, round, dark brown spots, those of the middle near the vertebral line being the largest, and those on the front of the dorsal shield more or less confluent, forming three interrupted cross bands.

It may be designated *Emyda fuscomaculata.*

The inside of the hinder part of the shells has a group of two or three concavities on each side of the part behind the pelvis, producing a pair of more or less prominent convexities outside. In one specimen (*d*) of *E. ceylonensis* there is a prominence on the outside of the hinder part of the dorsal shell over each concavity.

The same is to be observed in the inside of the shell of *Cyclanosteus senegalensis*; but there the cavity is single, more circular, and deeper, so that the substance left is translucent.

XXXIV.—*Additional Notes on the Guémul.*

By Dr. J. E. Gray, F.R.S. &c.

From letters that I have received it appears that the Guémul of Molina is still not understood.

There are in the British Museum three distinct species of deer to which this name has been applied; and perhaps Molina's account of it, which was only from reports of travellers, may itself have referred to two or more species.

Three species have been described; and we have the skulls of all the species, and specimens of two of the animals, in the British Museum:—

1. *Furcifer antisiensis* (*Cervus antisiensis* of D'Orbigny's 'Voyage,' t. 20), from the Bolivian Alps.